

MATH 113: NON-EUCLIDEAN GEOMETRY

WINTER QUARTER, 2015

1. COURSE INFORMATION

Instructor: Lee Kennard

Email: kennard@math.ucsb.edu

Meeting times: Tuesdays and Thursdays, 9:30am – 10:45am, in North Hall 1111.

Office hours: Tuesdays 2–4 and Thursdays after class until noon, in South Hall 6510.

Required reading: James W. Anderson's *Hyperbolic Geometry, Second Edition*

2. IMPORTANT DATES

Tues., Jan. 6	First day of class
Thur., Jan. 15	HW 1 due
Thur., Jan. 22	HW 2 due
Thur., Jan. 29	HW 3 due
Tues., Feb. 10	Midterm (in-class)
Tues., Feb. 24	HW 4 due
Tues., Mar. 3	HW 5 due
Tues., Mar. 10	HW 6 due
Tues., Mar. 17	Final exam

Other important dates include

- Feb. 2 (drop deadline)
- Feb. 27 (deadline to switch to pass/no pass)

3. CONTENT SUMMARY

In high school, you learned about the elements of geometry (points, lines, angles, polygons, etc.), and you proved many results about them (for example, the sum of the angles in a triangle is π). To be more specific, you studied what is called Euclidean geometry.

In this class, we will explore a different *geometry*, namely, *hyperbolic geometry*. We will learn what “points”, “lines”, and “angles” are in this geometry, and we will again prove results about these objects. Some familiar facts from Euclidean geometry also hold in hyperbolic geometry. For example, given distinct points x and y , there exists a unique hyperbolic line passing through x and y . Other theorems from Euclidean geometry will not carry over. For example, the sum of the angles in a hyperbolic triangle is not equal to π . However we will see that the difference between π and the sum of the angles is measured by the area of the triangle. The larger the triangle, the farther the sum of the angles is from π .

4. GRADES

In this course, you will be evaluated based on your participation in class, six homework assignments, a midterm, and a final exam.

Participation	10%
Homework	25%
Midterm	25%
Final exam	40%

- **Participation:** This primarily involves coming to, and not disrupting, class. If you will miss class due to a religious holiday, please contact me no later than two weeks in advance. If the holiday is a day on which homework is due, plan to turn in your homework early. If the holiday lands on an exam day, we will arrange another time for you to take it. I will deal with last-minute emergencies on a case-by-case basis.
- **Homework:** There will be six homework assignments. The due dates are above. At the end of the term, I will drop the lowest homework score. Your grade will be based on your highest five homework scores. For this reason, *late homework will not be accepted*.
- **Midterm:** The midterm will be given in class on Tuesday, October 30. There will be no make-up midterm, and you do not need to take the midterm. If you do not take the midterm, you will receive a temporary midterm score of 0 out of 25.

Independent of whether you take the midterm, your final midterm score will be the greater of your temporary midterm score and $5/8$ of your final score.

- Example 1: You miss the midterm and score an 80% on the final. This earns you 32 out of 40 on the final and 20 out of 25 on the midterm.
- Example 2: You do terribly on the midterm, scoring only 5 out of 25 points, but you do better on the final, scoring 32 out of 40. Your midterm score will be increased to 20 out of 25.
- Example 3: You get 23 out of 25 on the midterm and 32 out of 40 on the final. Since $5/8$ of your final score is *less* than your midterm score, your midterm score remains 23.

It is in your best interest to study for and take the midterm, since doing poorly on it or missing it raises the stakes for your final exam.

- **Exam:** Please set your alarm clocks properly – the exam begins at 8:00 am on Tuesday, March 17. In addition, I recommend finding breakfast and using the bathroom before showing up, since the grueling exam period last three hours. Missing the exam, appearing late, or leaving the exam for any reason should be done only in the case of an emergency (and approved by me in advance, if possible).

5. ACADEMIC DISHONESTY

I encourage you to work together on homework, as it can benefit everyone involved. However when you write up your homework, you should do so on your own. You should also credit others when they help you. A quick “Sue helped me with #2 and #5 on this homework.” is sufficient. It is also honest.

6. STUDENTS WITH DISABILITIES

Please contact both DSP (845-1637) and me so that we can make the appropriate arrangements. *Requests for extra time on exams must be made at least 2 weeks in advance*, in order for DSP to have sufficient time to arrange a proctor.